SEQUENCE LISTING

<110> HUANG, QIHONG
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       MAEDA, SUSUMU

<120> INHIBITOR OF APOPTOSIS PROTEINS AND NUCLEIC ACIDS AND
      METHODS FOR MAKING AND USING THEM

<130> 087102/027 2537

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<151> 2001-01-08

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<170> PatentIn Ver. 2.1

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<213> Bombyx mori

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aaaaaaaaaa aaaaagtcg tgactgggaa aa atg gag ttg acg aaa gtt gct      2753
                                  Met Glu Leu Thr Lys Val Ala
                                   1               5

aaa aat gga gct gcc gcc acg ttg gtg atg tta aaa aat gcg cgg gat    2801
Lys Asn Gly Ala Ala Ala Thr Leu Val Met Leu Lys Asn Ala Arg Asp
         10                15                20

gca aaa atg cga cct ttc att ggt ccg ctc atg tta tcc tcg tgt gag    2849
Ala Lys Met Arg Pro Phe Ile Gly Pro Leu Met Leu Ser Ser Cys Glu
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tct tca acg aca tcc aca ctc ccg tca cct tcg tcg tca gct gat aaa    2897
Ser Ser Thr Thr Ser Thr Leu Pro Ser Pro Ser Ser Ser Ala Asp Lys
 40                45                50                55

acg gat aat cac gac aca ttc aac ttc ctt cct gat atg ccc gac atg    2945
Thr Asp Asn His Asp Thr Phe Asn Phe Leu Pro Asp Met Pro Asp Met
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cgt cgt gaa gag gaa cgt ctg aaa aca ttt gat cag tgg ccc gtt acg    2993
Arg Arg Glu Glu Glu Arg Leu Lys Thr Phe Asp Gln Trp Pro Val Thr
             75                80                85

ttt ttg acg ccg gaa caa ttg gcc cgc aac gga ttc tac tac ctc ggt    3041
Phe Leu Thr Pro Glu Gln Leu Ala Arg Asn Gly Phe Tyr Tyr Leu Gly
         90                95                100

cgc ggc gac gaa gtg tgc tgt gct ttc tgt aag gta gaa att atg agg    3089
Arg Gly Asp Glu Val Cys Cys Ala Phe Cys Lys Val Glu Ile Met Arg
    105                110                115

tgg gtc gaa ggc gac gat cct gcc gcc gat cat cgg aga tgg gcg ccc    3137
Trp Val Glu Gly Asp Asp Pro Ala Ala Asp His Arg Arg Trp Ala Pro
120                125                130                135

cag tgt ccc ttt gta cga aaa caa atg tat gcc aac gct ggg gga gag    3185
Gln Cys Pro Phe Val Arg Lys Gln Met Tyr Ala Asn Ala Gly Gly Glu
                 140                145                150

gcg acc gct gtc ggt aga gac gaa tgt ggg gcc agt gcg gcc acg cag    3233
Ala Thr Ala Val Gly Arg Asp Glu Cys Gly Ala Ser Ala Ala Thr Gln
                 155                160                165

cct ccc cgc atg ccc ggc ccc gtg cac gcg cgg tac tcc acc gag gcc    3281
Pro Pro Arg Met Pro Gly Pro Val His Ala Arg Tyr Ser Thr Glu Ala
         170                175                180

gcg cgg ctc gcc acc ttc aag gac tgg ccg aga cgt atg cgc caa aaa    3329
Ala Arg Leu Ala Thr Phe Lys Asp Trp Pro Arg Arg Met Arg Gln Lys
     185                190                195
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4

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Pro Glu Glu Leu Ala Glu Ala Gly Phe Phe Tyr Thr Gly Gln Gly Asp
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aaa acg aaa tgc ttc tat tgc gac gga ggg cta aaa gat tgg gaa agc     3425
Lys Thr Lys Cys Phe Tyr Cys Asp Gly Gly Leu Lys Asp Trp Glu Ser
                220             225             230

gat gac gtt ccg tgg gaa cag cac gcc aga tgg ttc gac cgc tgc gcg     3473
Asp Asp Val Pro Trp Glu Gln His Ala Arg Trp Phe Asp Arg Cys Ala
            235             240             245

tac gtg caa ttg gtg aaa gga cgt gac tac att cag aag gtg aag tcg     3521
Tyr Val Gln Leu Val Lys Gly Arg Asp Tyr Ile Gln Lys Val Lys Ser
            250             255             260

gag gcc act gcg ata tct gct agc gaa gaa gaa cag gcc gcc acc aat     3569
Glu Ala Thr Ala Ile Ser Ala Ser Glu Glu Glu Gln Ala Ala Thr Asn
    265             270             275

gat tcg act aag aac gtc gcc caa gag ggc gag aaa cat ttg gat gac     3617
Asp Ser Thr Lys Asn Val Ala Gln Glu Gly Glu Lys His Leu Asp Asp
280             285             290             295

tct aaa ata tgt aaa ata tgt tat tcc gag gag cgt aac gtg tgc ttc     3665
Ser Lys Ile Cys Lys Ile Cys Tyr Ser Glu Glu Arg Asn Val Cys Phe
                300             305             310

gtg ccg tgc ggc cac gtg gtg gcg tgc gcc aag tgc gcg ctg tcg acg     3713
Val Pro Cys Gly His Val Val Ala Cys Ala Lys Cys Ala Leu Ser Thr
                315             320             325

gac aag tgc ccg atg tgt cgc agg acg ttc acg aat gcg gtg cgg ctc     3761
Asp Lys Cys Pro Met Cys Arg Arg Thr Phe Thr Asn Ala Val Arg Leu
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tac ttc tcg tga                                                      3773
Tyr Phe Ser
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<210> 2
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<213> Bombyx mori

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Met Leu Lys Asn Ala Arg Asp Ala Lys Met Arg Pro Phe Ile Gly Pro
            20              25              30

Leu Met Leu Ser Ser Cys Glu Ser Ser Thr Thr Ser Thr Leu Pro Ser
        35              40              45

Pro Ser Ser Ser Ala Asp Lys Thr Asp Asn His Asp Thr Phe Asn Phe
    50              55              60
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Leu Pro Asp Met Pro Asp Met Arg Arg Glu Glu Glu Arg Leu Lys Thr
65   70   75   80

Phe Asp Gln Trp Pro Val Thr Phe Leu Thr Pro Glu Gln Leu Ala Arg
                    85   90   95

Asn Gly Phe Tyr Tyr Leu Gly Arg Gly Asp Glu Val Cys Cys Ala Phe
                100   105   110

Cys Lys Val Glu Ile Met Arg Trp Val Glu Gly Asp Asp Pro Ala Ala
            115   120   125

Asp His Arg Arg Trp Ala Pro Gln Cys Pro Phe Val Arg Lys Gln Met
        130   135   140

Tyr Ala Asn Ala Gly Gly Glu Ala Thr Ala Val Gly Arg Asp Glu Cys
145   150   155   160

Gly Ala Ser Ala Ala Thr Gln Pro Pro Arg Met Pro Gly Pro Val His
                165   170   175

Ala Arg Tyr Ser Thr Glu Ala Ala Arg Leu Ala Thr Phe Lys Asp Trp
            180   185   190

Pro Arg Arg Met Arg Gln Lys Pro Glu Glu Leu Ala Glu Ala Gly Phe
        195   200   205

Phe Tyr Thr Gly Gln Gly Asp Lys Thr Lys Cys Phe Tyr Cys Asp Gly
    210   215   220

Gly Leu Lys Asp Trp Glu Ser Asp Asp Val Pro Trp Glu Gln His Ala
225   230   235   240

Arg Trp Phe Asp Arg Cys Ala Tyr Val Gln Leu Val Lys Gly Arg Asp
            245   250   255

Tyr Ile Gln Lys Val Lys Ser Glu Ala Thr Ala Ile Ser Ala Ser Glu
        260   265   270

Glu Glu Gln Ala Ala Thr Asn Asp Ser Thr Lys Asn Val Ala Gln Glu
        275   280   285

Gly Glu Lys His Leu Asp Asp Ser Lys Ile Cys Lys Ile Cys Tyr Ser
    290   295   300

Glu Glu Arg Asn Val Cys Phe Val Pro Cys Gly His Val Val Ala Cys
305   310   315   320

Ala Lys Cys Ala Leu Ser Thr Asp Lys Cys Pro Met Cys Arg Arg Thr
            325   330   335

Phe Thr Asn Ala Val Arg Leu Tyr Phe Ser
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<210> 3
<211> 20

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<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

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<222> (3)
<223> a, c, g or t

<220>
<221> modified_base
<222> (6)
<223> a, c, g or t

<220>
<221> modified_base
<222> (9)
<223> a, c, g or t

<220>
<221> modified_base
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<223> a, c, g or t

<400> 3
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<210> 4
<211> 17
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<220>
<221> modified_base
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<223> a, c, g or t

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<221> modified_base
<222> (9)
<223> a, c, g or t

<220>
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<400> 4
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<210> 5
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<210> 6
<211> 17
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

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<210> 7
<211> 28
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<213> Artificial Sequence

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<223> Description of Artificial Sequence: Conserved
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Xaa Xaa Xaa Xaa His Xaa Xaa Xaa Xaa Xaa Xaa Cys
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<210> 8
<211> 172
<212> PRT
<213> Bombyx mori

<400> 8
Glu Glu Glu Arg Leu Lys Thr Phe Asp Gln Trp Pro Val Thr Phe Leu
 1   5   10   15

Thr Pro Glu Gln Leu Ala Arg Asn Gly Phe Tyr Tyr Leu Gly Arg Gly
            20   25   30

Asp Glu Val Cys Cys Ala Phe Cys Lys Val Glu Ile Met Arg Trp Val
        35   40   45

Glu Gly Asp Asp Pro Ala Ala Asp His Arg Arg Trp Ala Pro Gln Cys
        50   55   60

Pro Phe Val Glu Ala Ala Arg Leu Ala Thr Phe Lys Asp Trp Pro Arg
65   70   75   80

Arg Met Arg Gln Lys Pro Glu Glu Leu Ala Glu Ala Gly Phe Phe Tyr
            85   90   95

Thr Gly Gln Gly Asp Lys Thr Lys Cys Phe Tyr Cys Asp Gly Gly Leu
            100   105   110

Lys Asp Trp Glu Ser Asp Asp Val Pro Trp Glu Gln His Ala Arg Trp
            115   120   125

Phe Asp Arg Cys Ala Tyr Val Leu Cys Lys Ile Cys Tyr Ser Glu Glu
        130   135   140

Arg Asn Val Cys Phe Val Pro Cys Gly His Val Val Ala Cys Ala Lys
145   150   155   160

Cys Ala Leu Ser Thr Asp Lys Cys Pro Met Cys Arg
            165   170

<210> 9
<211> 172
<212> PRT
<213> Spodoptera frugiperda

<400> 9
Glu Asp Glu Arg Met Lys Thr Phe Glu Lys Trp Pro Val Ser Phe Leu
 1   5   10   15

Ser Gly Glu Gln Leu Ala Arg Asn Gly Phe Tyr Tyr Leu Gly Arg Arg
            20   25   30

Asp Glu Ala Arg Cys Ala Phe Cys Lys Val Glu Ile Met Arg Trp Val
        35   40   45

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Glu Gly Asp Asp Pro Ala Lys Asp His Gln Arg Trp Ala Pro Gln Cys
     50                  55                  60

Pro Phe Val Glu Ala Ala Arg Leu Arg Ser Phe Lys Asp Trp Pro Arg
 65                  70                  75                  80

Cys Met Arg Gln Lys Pro Glu Glu Leu Ala Glu Ala Gly Phe Phe Tyr
             85                  90                  95

Thr Gly Gln Gly Asp Lys Thr Lys Cys Phe Tyr Cys Asp Gly Gly Leu
            100                 105                 110

Lys Asp Trp Glu Asn His Asp Val Pro Trp Glu Gln His Ala Arg Trp
        115                 120                 125

Phe Asp Arg Cys Ala Tyr Val Leu Cys Lys Ile Cys Tyr Ala Glu Glu
    130                 135                 140

Arg Asn Val Cys Phe Val Pro Cys Gly His Val Val Ala Cys Ala Lys
145             150                 155                 160

Cys Ala Leu Ala Ala Asp Lys Cys Pro Met Cys Arg
                165                 170
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<210> 10
<211> 172
<212> PRT
<213> Trichoplusia ni

<400> 10
Glu Asp Glu Arg Ile Lys Thr Phe Glu Lys Trp Pro Val Ser Phe Leu
  1             5                  10                  15

Ser Gly Glu Gln Leu Ala Arg Asn Gly Phe Tyr Tyr Leu Gly Arg Gly
             20                  25                  30

Asp Glu Val Arg Cys Ala Phe Cys Lys Val Glu Ile Met Arg Trp Val
         35                  40                  45

Glu Gly Asp Asp Pro Ala Lys Asp His Gln Arg Trp Ala Pro Gln Cys
     50                  55                  60

Pro Phe Val Glu Ala Ala Arg Leu Arg Ser Phe Lys Asp Trp Pro Arg
 65                  70                  75                  80

Cys Met Arg Gln Lys Pro Glu Glu Leu Ala Glu Ala Gly Phe Phe Tyr
             85                  90                  95

Thr Gly Gln Gly Asp Lys Thr Lys Cys Phe Tyr Cys Asp Gly Gly Leu
            100                 105                 110

Lys Asp Trp Glu Asn Asp Asp Val Pro Trp Glu Gln His Ala Arg Trp
        115                 120                 125

Phe Asp Arg Cys Ala Tyr Val Leu Cys Lys Ile Cys Phe Ala Glu Glu
    130                 135                 140
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```
Arg Asn Val Cys Phe Val Pro Cys Gly His Val Val Ala Cys Ala Lys
145                 150                 155                 160

Cys Ala Leu Ala Ala Asp Lys Cys Pro Met Cys Arg
                165                 170
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<210> 11
<211> 172
<212> PRT
<213> Cydia pomonella granulovirus

<400> 11
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Ser Pro Glu Thr Met Ala Lys Asn Gly Phe Tyr Tyr Leu Gly Arg Ser
                20                  25                  30

Asp Glu Val Arg Cys Ala Phe Cys Lys Val Glu Ile Met Arg Trp Lys
                35                  40                  45

Glu Gly Glu Asp Pro Ala Ala Asp His Lys Lys Trp Ala Pro Gln Cys
      50                  55                  60

Pro Phe Val Glu Ala Ala Arg Val Lys Ser Phe His Asn Trp Pro Arg
 65                  70                  75                  80

Cys Met Lys Gln Arg Pro Glu Gln Met Ala Asp Ala Gly Phe Phe Tyr
                85                  90                  95

Thr Gly Tyr Gly Asp Asn Thr Lys Cys Phe Tyr Cys Asp Gly Gly Leu
               100                 105                 110

Lys Asp Trp Glu Pro Glu Asp Val Pro Trp Glu Gln His Val Arg Trp
            115                 120                 125

Phe Asp Arg Cys Ala Tyr Val Leu Cys Lys Ile Cys Tyr Val Glu Glu
            130                 135                 140

Cys Ile Val Cys Phe Val Pro Cys Gly His Val Val Ala Cys Ala Lys
145                 150                 155                 160

Cys Ala Leu Ser Val Asp Lys Cys Pro Met Cys Arg
                165                 170
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<210> 12
<211> 172
<212> PRT
<213> Orgyia pseudotsugata

<400> 12
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  1               5                  10                  15
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Glu Pro Ser Arg Met Ala Ala Ser Gly Phe Tyr Tyr Leu Gly Arg Gly
            20   25   30

Asp Glu Val Arg Cys Ala Phe Cys Lys Val Glu Ile Thr Asn Trp Val
            35   40   45

Arg Gly Asp Asp Pro Glu Thr Asp His Lys Arg Trp Ala Pro Gln Cys
        50   55   60

Pro Phe Val Glu Ala Ala Arg Leu Arg Thr Phe Ala Glu Trp Pro Arg
65   70   75   80

Gly Leu Lys Gln Arg Pro Glu Glu Leu Ala Glu Ala Gly Phe Phe Tyr
                85   90   95

Thr Gly Gln Gly Asp Lys Thr Arg Cys Phe Cys Cys Asp Gly Gly Leu
            100   105   110

Lys Asp Trp Glu Pro Asp Asp Ala Pro Trp Gln Gln His Ala Arg Trp
            115   120   125

Tyr Asp Arg Cys Glu Tyr Val Leu Cys Lys Ile Cys Leu Gly Ala Glu
    130   135   140

Lys Thr Val Cys Phe Val Pro Cys Gly His Val Val Ala Cys Gly Lys
145   150   155   160

Cys Ala Ala Gly Val Thr Thr Cys Pro Val Cys Arg
            165   170

<210> 13
<211> 172
<212> PRT
<213> Drosophila melanogaster

<400> 13
Glu Glu Thr Arg Leu Lys Thr Phe Thr Asp Trp Pro Leu Asp Trp Leu
    1   5   10   15

Asp Lys Arg Gln Leu Ala Gln Thr Gly Met Tyr Phe Thr His Ala Gly
            20   25   30

Asp Lys Val Lys Cys Phe Phe Cys Gly Val Glu Ile Gly Cys Trp Glu
            35   40   45

Gln Glu Asp Gln Pro Val Pro Glu His Gln Arg Trp Ser Pro Asn Cys
        50   55   60

Pro Leu Leu Glu Thr Ala Arg Leu Arg Thr Phe Glu Ala Trp Pro Arg
65   70   75   80

Asn Leu Lys Gln Lys Pro His Gln Leu Ala Glu Ala Gly Phe Phe Tyr
                85   90   95

Thr Gly Val Gly Asp Arg Val Arg Cys Phe Ser Cys Gly Gly Gly Leu
            100   105   110

Met Asp Trp Asn Asp Asn Asp Glu Pro Trp Glu Gln His Ala Leu Trp
        115   120   125

Leu Ser Gln Cys Arg Phe Val Leu Cys Lys Ile Cys Tyr Gly Ala Glu
    130   135   140

Tyr Asn Thr Ala Phe Leu Pro Cys Gly His Val Val Ala Cys Ala Lys
145   150   155   160

Cys Ala Ser Ser Val Thr Lys Cys Pro Leu Cys Arg
                165   170

<210> 14
<211> 68
<212> PRT
<213> Bombyx mori

<400> 14
Glu Ala Ala Arg Leu Ala Thr Phe Lys Asp Trp Pro Arg Arg Met Arg
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Gln Lys Pro Glu Glu Leu Ala Glu Ala Gly Phe Phe Tyr Thr Gly Gln
            20   25   30

Gly Asp Lys Thr Lys Cys Phe Tyr Cys Asp Gly Gly Leu Lys Asp Trp
        35   40   45

Glu Ser Asp Asp Val Pro Trp Glu Gln His Ala Arg Trp Phe Asp Arg
    50   55   60

Cys Ala Tyr Val
 65

<210> 15
<211> 68
<212> PRT
<213> Spodoptera frugiperda

<400> 15
Glu Ala Ala Arg Leu Arg Ser Phe Lys Asp Trp Pro Arg Cys Met Arg
 1   5   10   15

Gln Lys Pro Glu Glu Leu Ala Glu Ala Gly Phe Phe Tyr Thr Gly Gln
            20   25   30

Gly Asp Lys Thr Lys Cys Phe Tyr Cys Asp Gly Gly Leu Lys Asp Trp
        35   40   45

Glu Asn His Asp Val Pro Trp Glu Gln His Ala Arg Trp Phe Asp Arg
    50   55   60

Cys Ala Tyr Val
 65

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<210> 16
<211> 68
<212> PRT
<213> Trichoplusia ni

<400> 16
Glu Ala Ala Arg Leu Arg Ser Phe Lys Asp Trp Pro Arg Cys Met Arg
 1               5                  10                  15

Gln Lys Pro Glu Glu Leu Ala Glu Ala Gly Phe Phe Tyr Thr Gly Gln
            20                  25                  30

Gly Asp Lys Thr Lys Cys Phe Tyr Cys Asp Gly Gly Leu Lys Asp Trp
        35                  40                  45

Glu Asn Asp Asp Val Pro Trp Glu Gln His Ala Arg Trp Phe Asp Arg
    50                  55                  60

Cys Ala Tyr Val
 65


<210> 17
<211> 68
<212> PRT
<213> Cydia pomonella granulovirus

<400> 17
Glu Ala Ala Arg Val Lys Ser Phe His Asn Trp Pro Arg Cys Met Lys
 1               5                  10                  15

Gln Arg Pro Glu Gln Met Ala Asp Ala Gly Phe Phe Tyr Thr Gly Tyr
            20                  25                  30

Gly Asp Asn Thr Lys Cys Phe Tyr Cys Asp Gly Gly Leu Lys Asp Trp
        35                  40                  45

Glu Pro Glu Asp Val Pro Trp Glu Gln His Val Arg Trp Phe Asp Arg
    50                  55                  60

Cys Ala Tyr Val
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<210> 18
<211> 68
<212> PRT
<213> Orgyia pseudotsugata

<400> 18
Glu Ala Ala Arg Leu Arg Thr Phe Ala Glu Trp Pro Arg Gly Leu Lys
 1               5                  10                  15

Gln Arg Pro Glu Glu Leu Ala Glu Ala Gly Phe Phe Tyr Thr Gly Gln
            20                  25                  30

Gly Asp Lys Thr Arg Cys Phe Cys Cys Asp Gly Gly Leu Lys Asp Trp
        35                  40                  45
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Glu Pro Asp Asp Ala Pro Trp Gln Gln His Ala Arg Trp Tyr Asp Arg
    50   55   60

Cys Glu Tyr Val
 65

<210> 19
<211> 68
<212> PRT
<213> Drosophila melanogaster

<400> 19
Glu Thr Ala Arg Leu Arg Thr Phe Glu Ala Trp Pro Arg Asn Leu Lys
  1   5   10   15

Gln Lys Pro His Gln Leu Ala Glu Ala Gly Phe Phe Tyr Thr Gly Val
          20   25   30

Gly Asp Arg Val Arg Cys Phe Ser Cys Gly Gly Gly Leu Met Asp Trp
         35   40   45

Asn Asp Asn Asp Glu Pro Trp Glu Gln His Ala Leu Trp Leu Ser Gln
    50   55   60

Cys Arg Phe Val
 65

<210> 20
<211> 37
<212> PRT
<213> Bombyx mori

<400> 20
Leu Cys Lys Ile Cys Tyr Ser Glu Glu Arg Asn Val Cys Phe Val Pro
  1   5   10   15

Cys Gly His Val Val Ala Cys Ala Lys Cys Ala Leu Ser Thr Asp Lys
          20   25   30

Cys Pro Met Cys Arg
         35

<210> 21
<211> 37
<212> PRT
<213> Spodoptera frugiperda

<400> 21
Leu Cys Lys Ile Cys Tyr Ala Glu Glu Arg Asn Val Cys Phe Val Pro
  1   5   10   15

Cys Gly His Val Val Ala Cys Ala Lys Cys Ala Leu Ala Ala Asp Lys
          20   25   30

Cys Pro Met Cys Arg
          35

<210> 22
<211> 37
<212> PRT
<213> Trichoplusia ni

<400> 22
Leu Cys Lys Ile Cys Phe Ala Glu Glu Arg Asn Val Cys Phe Val Pro
  1   5   10   15

Cys Gly His Val Val Ala Cys Ala Lys Cys Ala Leu Ala Ala Asp Lys
              20   25   30

Cys Pro Met Cys Arg
          35

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Cys Pro Met Cys Arg
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Cys Pro Leu Cys Arg
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